SOME OF THE DIFFICULTIES OF CLIMATOTHERAPY.[1]

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THE trend of medical investigation and of medical energy to-day is in the direction of therapy. For a decade all the activities of the profession seemed to gather about surgery. Trephining, laparotomy, hysterectomy, and their ilk filled our medical journals, almost to the exclusion of all else. The rapid pace could not be continuous, however, and conservatism is calling a halt in some directions at least. Technique alone seems to be left for discussion in surgical matters, apart from the disputes which ever arise between the heroic operator and his more conservative and usually older brother. Therapy is now in the van. The wholesale discovery and presentation of new and active pharmaceutical agents, whose countless additions to our armamentarium are almost bewildering, have added unto them animal-extracts; and nuclein, bone-marrow, various antitoxins, thyroid and other gland extractions fill our societies with discussion, our journals with reading-matter, and the daily newspapers with sensational pabulum. Therapy is, to the medical man, what operations are to the surgeon—the means of relief from diseased conditions. This must ever be the ultimate object of all medical investigation. Koch's bacillus might as well have remained an unknown factor in disease so far as the patient, its host, goes, or so far as his physician is concerned, except as it may illumine the way to its own destruction.

The activity in therapy is not alone expressed in the remedial agents which the laboratories are evolving. More and more is the profession turning toward that *facile princeps*, preventive medicine, and to those so-called " natural agencies " which are so abundantly provided for our invigoration when well and recuperation when sick.

Among these natural agencies stands prominently in the foreground, climate; and climatotherapy is not only claiming more and more serious attention, but is deserving of vastly more than it has thus far succeeded in obtaining.

Ever since our progenitors left the ancestral cradle on the Iranian plateau and scattered to the " four winds of heaven," the race has been battling and dying, growing stronger and weaker, in its efforts at acclimatization. As new countries were conquered and occupied as permanent dwelling-places, the aborigines being annihilated or assimilated, this attempt to accommodate itself to its ever new and mostly varying environment has occupied not a little of the energy of the race, as the restless spirit of enterprise has driven it East, West, North, or South.

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[1] Address as President of American Climatological Association, Lakewood, N. J., 1896.

That the efforts at acclimatization have been successfully accomplished for the race, the "survival of the fittest," under all conditions of environment, bears abundant testimony; but that, in the effort, the individual has been abundantly sacrificed, the vast hordes that have succumbed to the various local causes of disease and death bear equal witness. Into the ranks arrive constantly new individuals in every community, who, from inherent or acquired vulnerability, find it impossible to live at peace with their environment; and, as their vulnerability exhibits itself in the form of actual disease, the question must arise, in the management of such an organism, Is it possible so to fortify him as to lessen his vulnerability and establish his resistance and enable him to battle successfully with his foe in his present environment? If not, if he, as an individual, cannot accommodate himself to his environment, can an environment be furnished which, accommodating itself to his requirements, will aid him in the struggle?

Around this question centre the efforts of the climatotherapist, and in the settlement or solution of it he finds certain difficulties, some of which I shall endeavor to place before you, in the hope that it will stimulate us to greater efforts to elucidate and simplify this somewhat complex problem, which is the especial object of our Association.

The chief difficulties which the climatotherapist encounters may perhaps be classed under the following heads:

1. The uncertainty of the composition of the agent.
2. Lack of sufficient data concerning many American stations.
3. Difficulty of choice for the individual case.
4. Lack of general information as to the elements of climate affecting health and the consequent lack of ability wisely to use the agent.

THE UNCERTAINTY OF THE COMPOSITION OF THE AGENT. If each health-resort had its climatic elements in fairly definite quantity, barring such variations as must be incident to changing seasons, climatotherapy would constitute one of the simplest and plainest of lessons. One could choose, by latitude or isothermal line, the amount of cold desired, and altitude and insular or inland location would do the rest; but, unfortunately, such is not the state of the case. "The wind bloweth where it listeth" now as in "ye olden time," and at least along seaboards its direction constantly modifies temperature, humidity, and barometric pressure. So far as seaboard-resorts are concerned, therefore, only an approximate estimate of the climate to be anticipated can be made; so that our prescription may be only partially filled, and substitutions, much more serious than those which some pharmacists are said to make, may occur, so completely altering the effect as even to jeopardize life. Each of us can supply incidents from our own experience, some serious, some ludicrous, illustrative of misplaced confidence in climate. An intimate friend of mine sent a phthisical patient to

Marietta, Georgia, to remain during the winter months. She and her attendant arrived there the night before that frost, that "chilling frost" which extended even to Florida, with destructive effect on the orange-groves. The patient did not wait for further developments, but speedily returned North, where provision is made beforehand for that kind of weather; and thereafter had serious doubts about the wisdom of her medical adviser as to matters climatic. Only this winter I sent a convalescent to a noted Southern resort whose moderate altitude has been ofttimes vaunted as entitling it to be the "all-the-year-around" favorite. I sent her there that she might have more days of sunshine to ride or drive and otherwise recoup her vigor. A few days later, when the vicinity of Philadelphia was mild, pleasant, and open, I received a letter stating that, owing to the snow, they had been unable to enjoy as much out-of-door life as was desirable. They hoped, however, for better things, and, waiting, got them. When even Colorado Springs, that paradise for the phthisical, with Pike's Peak ever at her elbow to freeze any excess of moisture from her diathermic atmosphere, may lie "for seventeen successive days under a canopy of clouds," without a ray of sunshine to idealize her usually unexcelled "invalid's day," one can readily see that climatotherapy presents some problems not easy of solution. This difficulty, however, chiefly affects, to a serious extent, only those cases in which short doses of climate are prescribed. Taking the season through, a moderately fair estimate of the climate to be expected may be made; and this, after all, affects most of those cases in which it seems to be more particularly an essential element in the treatment. A convalescent sent for a few weeks to hasten recuperation to any resort, and especially seaboard-resorts, may stumble upon exceptional weather and be worse off than if he had remained at home; but the phthisical or the rheumatic who should go for a longer time, or for a permanent residence, will usually find, in the season through, that fair average or mean climatic condition which he seeks.

Lack of Sufficient Data Concerning Many, if not All, American Stations. Much has undoubtedly been already accomplished in this direction. The researches of Solly, Fisk, Denison, Ruedi, von Ruck, Orme, Remondini, and others have given us insight into this subject concerning some of our most noted and, perhaps, the most important stations for the climatic treatment of consumptives; but many others have been but imperfectly presented to the profession, and most of those of which we have records have furnished no comparative data, but chiefly the facts concerning one locality alone, giving us no comprehensive view of our climatic stations as a whole, as has been done for European stations by men of wide experience with the different localities.

Agencies are, however, at work in our own country which tend to modify climatic conditions and which necessitate continuous records in order to enable us to prescribe climate wisely. The removal of large tracts of timber, the irrigation of extensive, almost deserted wastes, and the consequent abundant vegetation resulting, may vary greatly the humidity of a locality and modify decidedly the climatic conditions. Increasing population, producing towns and even cities in a few years, may modify, for better or worse, the pre-existing conditions. Railway facilities and desirable hotels and boarding-houses are annually bringing new resorts for our study, and the absence of the same place many otherwise most desirable and beneficial localities under ban. Climate, without good food and shelter from vicissitudes, counts for nothing to the chronic invalid in his battle with a mortal foe. The more important health-resorts in Europe have not this difficulty to contend with. Their established reputations, with ease of access and thorough adaptation to all of the needs, physical and social, of the invalid, remove this difficulty from the problem. Then, again, their climate is usually more stable, less subject to marked variations, owing to their altitude, like San Moritz and other Alpine stations; their background of mountain-range, like places along the Riviera, or their insular position, like Madeira. Time, with the devotion of the medical profession, has done for their resorts what it will do for those of this country. Meanwhile we must wait, and work while we wait. Our own Association, besides gathering from its widely scattered membership facts concerning the various stations throughout the country, has an energetic and conscientious committee gathering data which must greatly advance our knowledge of the climatic features at our disposal and place on a more definite basis the absolute facts concerning the different resorts, bared of the tinsel and glitter of hyper-enthusiasts. Professor Moore and Dr. Phillips, of the Government Weather Bureau, have begun, in their monthly issue of a pamphlet on *Climate and Health*, a work which will no doubt be elaborated as time goes on, and prove of incalculable benefit to the climatologist. This work exhibits the climatic conditions for the same period of time of almost a hundred stations scattered over the United States, giving their barometric pressure, temperature, humidity, rainfall, number of days clear, partly cloudy, cloudy and rainy, and the direction and average daily movement of the wind. It also gives reports from about one hundred and seventy-five stations as to the prevailing sickness in these different localities and their surroundings, which will undoubtedly prove of much benefit to the statistician of the causes of disease and the climatic conditions favoring their origin, spread, and mortality.

THE DIFFICULTY OF CHOICE FOR THE INDIVIDUAL CASE. This constitutes one of the most decided difficulties of the whole subject. It is, at this time, one of the most important points in climatotherapy. It applies alike to our European *confrères* and to ourselves. All therapeusis, however, presents the same difficulty. Remedial agencies of any sort applied to apparently similar cases do not invariably bring about the same result. This is especially true of climates. Of two patients, apparently about equally affected with phthisis, and, so far as we can judge, equally promising under favorable conditions, sent to the same resort and subjected to the same care, one will improve—perhaps recover, and the other may continue uninterruptedly to grow worse, or, improving at first, may later rapidly or slowly decline. Williams tells us of twenty selected cases sent by the Brompton Hospital to Madeira for one winter. Only three improved, one died, and the rest returned to England worse than when they started; and yet these cases were carefully selected by the hospital staff as most likely to benefit by that climate.

Undoubtedly familiarity with the agent enables one to choose the suitable station with fewer errors than they can do who are less familiar with climatic effects. In my opinion the best elucidation yet presented on climatotherapy is to be found in the work entitled *Aërotherapy*, by C. Theodore Williams, published in 1894. He lays down propositions and conclusions from his most extensive experience which should greatly help the profession. Although his experience has chiefly been with what to us are foreign stations, he has had some acquaintance with a few of the more important of those of our own country, both through patients whom he has sent and also through a personal visit thereto. The principle that he establishes for the foreign resorts may serve as a foundation for a more rational climatotherapy with us, as the same or markedly similar climates to those which he has chiefly used are to be found within our borders.

LACK OF GENERAL INFORMATION AS TO THE ELEMENTS OF THE CLIMATE AFFECTING HEALTH, AND THE CONSEQUENT LACK OF ABILITY WISELY TO USE THE AGENT. The question paramount in most minds about to employ climate in a given case is, "What is the best climate for phthisical patients?" The question should ever be, "What is the best climate for *this* phthisical patient?" *There is no antibacillary climate habitable.* Climate is or may be a factor to aid in resisting disease by recuperating energies or by lessening causes of aggravation. It is a complex factor, variously compounded. It should be prescribed, as any other remedy is prescribed, with knowledge of its constituent elements and with forethought as to the effects of the especial combination and the especial case at hand. The four elements of climate chiefly affecting health are: temperature; humidity, including sunshine; air-movement or wind; and atmospheric pressure, including altitude. As nearly as possible in a given case one should choose that place whose possession of these constituents in appropriate combination seems best calculated to induce a favorable result. The principal modifying factors of these constituents are due to: 1. Distance from the equator. 2. Height above sea-level. 3. Distance from the sea. 4. Prevailing winds. 5. Character of the soil.

It must be apparent that, in our vast extent of continent, bathed on its eastern and western borders by the principal oceans of the earth, extending through the breadth of the temperate zone, and possessed of mountains and plateaus so located as to insure to our patients altitude with such combination of desirable qualities as are unequalled even in the best of the Alpine stations, I repeat, with such factors for modifying climate we should be, and are, able to find within our own borders and on the islands adjacent all varieties from which to make selection. Our high-altitude stations are considered by most authorities as superior to those of the Engadine in many respects, one of which is the absence of wet soil from the melting of snow, it seeming to dry away, owing to the amount of sunshine and the character of the soil. The Engadine at the time of snow-melting, in the spring, is unfitted for consumptives, though they may return later with benefit. One objectionable feature in our Colorado climate is the dust, which makes it less desirable for irritative mucous membranes than is the Engadine, which, during the winter, is snow-covered. Apart from this feature, however, Colorado and New Mexico, running into Texas, present the climate *par excellence* for all cases of phthisis in which altitude is not contraindicated.

Dr. Holland, the English-speaking physician at San Moritz, agrees in the main with C. Theodore Williams and most of our own authorities as to the advantages and contraindications of altitude. The latter writer has formulated the following as his experience of the influence of altitude in phthisical cases:

"1. Enlargement of the thorax, unless opposed by fibrosis or by extensive adhesions.

"2. Males and females seem to do equally well, and profit most between the ages of twenty and thirty, males over thirty and females under twenty being benefited least.

"3. The climate is especially beneficial in hemorrhagic cases. (Holland considers that hæmoptysis is not a barrier to high-altitude treatment, so that this formerly supposed contraindication is losing supporters abroad as well as with us.) In hereditary cases it seems to exercise a distinctly counteracting influence on the development of phthisis.

"4. It is most effective in cases of recent date, though of utility in those of long standing. To insure benefit, at least six months, and, preferably, two years' stay, is desirable.

"5. It produces undoubted improvement in 75 per cent. of phthisis generally, and arrests the tuberculous process completely in 43 per cent."

He considers that its influence is best shown in consolidation, in which improvement may be looked for in 87 per cent. and arrest in 57 per cent.

In excavations great improvement occurs in 55 per cent. and arrest in 16 per cent., so far as his cases may be taken as a measure. The *general* improvement of which he speaks consists in improved digestion and assimilation, gain of weight, and return of normal functions, and of color, and of muscular, respiratory, and circulatory power, at the same time that the evidences of disease cease to manifest themselves.

This list of *contraindications* will serve as a basis for decision, and probably applies with equal force to all high-altitude climates.

" 1. Phthisis with double cavities.

" 2. Fibroid phthisis and all other conditions in which the healthy pulmonary area hardly suffices for respiratory purposes at sea-level.

" 3. Catarrhal and laryngeal phthisis. (Holland would include cases with so-called 'gastrointestinal catarrh.')

" 4. Acute phthisis of all kinds, especially when associated with nervous irritability.

" 5. Phthisis with pyrexia.

" 6. Emphysema.

" 7. Chronic bronchitis and bronchiectasis.

" Organic disease of the heart and great vessels. (Holland considers *obstructive* disease to be an absolute contraindication; but, from his experience, if the pulmonary condition warrants the prescription of high altitude for its treatment, *regurgitant* lesion of the heart is no barrier.)

" 8. Diseases of the liver and kidneys, including all forms of albuminuria.

" 9. Disease of the brain and spinal cord.

" 10. Anæmia. (Holland, on the other hand, has found that anæmia cases, as a rule, do well, especially in summer; whereas the scrofulous do best in winter. This applies especially to children, who should arrive early in the season, before November, Solly's experience supports that of Holland as to the benefit of high altitudes in anæmia.)

" 11. Patients too feeble to take exercise.

" 12. Patients who have degenerated organs from long residence in tropical countries."

In considering the effects of altitude, Williams does not forget a most important adjunct to altitude, to which his patients were subjected, viz., the careful medical supervision, as practised in the Alpine stations where most of his cases were sent, and where supervision is both easier and more complete than in the Riviera and most of the southern resorts. His admission on this score corresponds with the repeated and unanimous advice of those familiar with our own high-altitude stations —that patients sent to such places should not be left to their own devices in using so potent a remedy, but should be referred to some competent physician, whose familiarity with the effects of altitude may help the patient to avoid deteriorating agencies and to obtain the best results possible by a careful supervision of his life and habits.

Dr. Solly, in a paper read before the American Public Health Association in Denver, 1895, deals with the hæmatogenetic results from altitude in a thoroughly scientific manner. He quotes from a paper by Dr. Egger, before the Congress at Wiesbaden, 1893, to show the resulting increase in red corpuscles and in the total amount of hæmoglobin in the blood. In other words, the blood, as an oxygen-bearer, is decidedly magnified. Solly concludes, from these studies, which have been verified by studies by Koeppe and Wolf, that we have good reason to believe that there is developed in life at high altitudes a greater power of resistance to the attempted lodgement of germs within the body by means of the increased germicidal character of the more highly oxygenated blood and through the more perfect working of the heart and lungs.

It must be remembered that our resorts at high altitude furnish us not only with the especial stimuli to the respiratory and circulatory functions which attenuated air furnishes, but also less humidity, with its effects on sunshine, and increased power of the sun's rays as well as the roborant effect of cold.

Dr. Ruedi, personally familiar with both the Engadine and the Colorado climate, in a paper read before this Association in Philadelphia, in 1893, giving an elaborate comparison of the two localities, concludes that "in barometric variation, humidity, sunshine, and temperature, Colorado, New Mexio, and parts of Arizona have, in their mountains, natural advantages and climatic conditions which equal or surpass the best European health-resorts of this character."

Cases of phthisis suitable for transplanting climatically, but unsuited for altitude, may find relief in the warm and moist climates of sea-voyages. Irritative cases with bronchial or laryngeal catarrh are especially benefited, as also are cases in which a neurosis complicates the attack. Insular localities, like Jamaica or the Bermudas, may do for us what Madeira serves for the Europeans; and, with its mountain-range, Jamaica gives an opportunity for a more decided choice and variety than most islands furnish. Its benefits for the phthisical were well presented at the last Pan-American Congress, in the Section on Climate, by Dr. Wolford Nelson, of New York; Dr. James Henry Clark and Dr. James Cecil Phillipps, of Jamaica.

Southern California furnishes a warm climate with less humidity than a sea-voyage, and a varying humidity as the immediate seaboard or higher and drier points inland are chosen. The station is probably superior to the Riviera, with a somewhat similar climate.

It may be, however, that the continued experience of Trudeau, in the Adirondacks; Bowditch, at Chelsea; von Ruck, at Asheville, and others, will show that the sanatorium treatment of phthisis, with complete supervision and explicit personal care adapted to the particular case, gives as good results as the climatic, and that the future will not consign the incipient phthisical to a life of exile from home and friends. We await developments of what have already given promising results.